CLAIMS

Sub B1 1. A data communications link comprising a data transmitter station coupled by an optical communications channel to a data receiver station,

wherein the data transmitter station includes a multi-power-level optical source connected to receive data words of n digital bits and arranged to encode the bits of each word into one of m optical power levels, the multi-power-level output signal of the optical source being transmitted along the optical communications channel to the data receiver station, said data receiver station including a data-decoding receiver arranged to receive and decode said multi-power-level optical signal into n bit digital words,

and wherein said receiver station further comprises a received-signal condition monitor coupled by a control channel to a control device located in the data transmitter station, said condition monitor being arranged to sense the level of a predetermined characteristic of the signal received by the data-decoding receiver and consequently to transmit a control signal along the control channel to the control device,

said control device being adapted to control the power output of the optical source consistent with achieving a predetermined sensed level of said predetermined characteristic.

2. A data communications link as claimed in claim 1, wherein the predetermined characteristic is the DC level or the average optical power level of the signal received by the receiver, the sensed level being compared against a control or reference level to establish a difference and the arrangement is such that the control signal attempts to null that difference or at least to keep the difference within narrow predetermined limits.

3. A data communications link as claimed in claim 1, wherein the predetermined characteristic is the individual bit content of a multibit test word transmitted at preselected times the condition monitor being preprogrammed with the bits of the test word against which the individual bits of the transmitted test word are compared and in the event of a difference the control signal is arranged to increase or decrease the power output of the transmitter in order to reduce the error.

4. A data communications link as claimed in claim 1, wherein the control channel is any one of:

a serial binary digital optical channel;
a parallel binary digital optical channel;
a serial binary digital electrical channel;
a parallel binary digital electrical channel;
a serial multilevel digital electrical channel;
a parallel mutlilevel digital electrical channel;
or an analogue electrical channel.

5. A data communication link as claimed in claim 1, wherein the bandwidth of the optical communications channel is the same as or greater than that of the control channel.

6. A data communications link as claimed in claim 1, wherein the optical source is a laser or an LED and the drive current supplied to the optical source is tailored to the characteristics of the source by individually adjusting the current drive levels such that each of the optical power levels is sufficiently separated from the levels above and below it for the receiver to quantise each level and maintain an adequate bit error rate, thus accommodating non linear source output power versus drive current characteristics.